



**DEPARTMENT OF ENERGY**

**10 CFR Part 431**

**EERE-2011-BT-DET-0045**

**RIN 1905-AC55**

**Energy Conservation Program: Final Determination of Fans and Blowers as Covered Equipment**

**AGENCY:** Office of Energy Efficiency and Renewable Energy, Department of Energy.

**ACTION:** Final rule; final determination.

**SUMMARY:** The U.S. Department of Energy (“DOE”) is classifying certain fans and blowers as covered equipment under Part A-1 of Title III of the Energy Policy and Conservation Act, as amended. Accordingly, this document establishes the definition of equipment that is considered fans and blowers.

**DATES:** This final determination is effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER]

**ADDRESSES:** *Docket:* The docket, which includes *Federal Register* notices, public meeting attendee lists and transcripts, comments, and other supporting documents/materials, is available for review at [www.regulations.gov](http://www.regulations.gov). All documents in the docket are listed in the [www.regulations.gov](http://www.regulations.gov) index. However, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

The docket web page can be found at [www.regulations.gov/docket/EERE-2011-BT-DET-0045](http://www.regulations.gov/docket/EERE-2011-BT-DET-0045). The docket web page contains instructions on how to access all documents, including public comments, in the docket.

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For further information on how to review other public comments and the docket contact the Appliance and Equipment Standards Program staff at (202) 287-1445 or by email: [ApplianceStandardsQuestions@ee.doe.gov](mailto:ApplianceStandardsQuestions@ee.doe.gov).

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## **I. Introduction**

The following section briefly discusses the statutory authority underlying this determination, as well as the relevant historical background to the inclusion of fans and blowers as covered equipment under the Energy Policy and Conservation Act, as amended (“EPCA”).<sup>1</sup>

### *A. Authority*

EPCA authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C<sup>2</sup> of EPCA, added by Public Law 95-619, Title IV, section 441(a) (42 U.S.C. 6311-6317, as codified), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency of certain commercial and industrial equipment (hereafter referred to as “covered equipment”). The purpose of Part A-1 is to improve the efficiency of electric motors and pumps and certain other industrial equipment in order to conserve the energy resources of the Nation. (42 U.S.C. 6312(a))

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<sup>1</sup> All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Public Law 116–260 (Dec. 27, 2020).

<sup>2</sup> For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A-1 and hereafter referred to as Part A-1.

EPCA specifies a list of equipment that constitutes covered equipment.<sup>3</sup> EPCA also provides that “covered equipment” includes any other type of industrial equipment for which the Secretary of Energy (“Secretary”) determines inclusion is necessary to carry out the purpose of Part A-1. (42 U.S.C. 6311(1)(L); 42 U.S.C. 6312(b)) EPCA specifies the types of equipment that can be classified as industrial equipment. (42 U.S.C. 6311(2) This equipment includes fans and blowers. (42 U.S.C. 6311(2)(B)(ii) and (iii)). Industrial equipment must be of a type that consumes, or is designed to consume, energy in operation; is distributed in commerce for industrial or commercial use; and is not a covered product as defined in 42 U.S.C. 6291(a)(2) of EPCA other than a component of a covered product with respect to which there is in effect a determination under section 6312(c). (42 U.S.C. 6311(2)(A)).

### *B. Background*

On June 28, 2011, DOE published a notice of proposed determination of coverage proposing to determine that fans, blowers, and fume hoods qualify as covered equipment (“June 2011 NOPD”). 76 FR 37678. DOE noted that there are no statutory definitions for “fan,” “blower,” or “fume hood,” and presented definitions for consideration. 76 FR 37678, 37679.

In the June 2011 NOPD, DOE preliminarily determined that coverage of fans, blowers, and fume hoods is necessary to carry out the purposes of Part A-1 because

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<sup>3</sup> “Covered equipment” means one of the following types of industrial equipment: Electric motors and pumps; small commercial package air conditioning and heating equipment; large commercial package air conditioning and heating equipment; very large commercial package air conditioning and heating equipment; commercial refrigerators, freezers, and refrigerator-freezers; automatic commercial ice makers; walk-in coolers and walk-in freezers; commercial clothes washers; packaged terminal air-conditioners and packaged terminal heat pumps; warm air furnaces and packaged boilers; and storage water heaters, instantaneous water heaters, and unfired hot water storage tanks. (42 U.S.C. 6311(1)(A)-(K))

coverage would promote the conservation of energy supplies. 76 FR 37678, 37680.

DOE estimated that technologies exist which can reduce the electricity consumption of fans and blowers by as much as 20 percent and that there are technologies and design strategies for fume hoods that could reduce energy use by 50 percent. *Id.* DOE requested comment on the proposed definitions and its preliminary determination that coverage of fans, blowers, and fume hoods is necessary to carry out the purposes of Part A-1. 76 FR 37678, 37682.

DOE received seven comments in response to the June 2011 NOPD from the interested parties listed in Table II-1 of this document.

DOE subsequently published a framework document<sup>4</sup> detailing an analytical approach for developing potential energy conservation standards for commercial and industrial fans and blowers should the Secretary classify such equipment as covered equipment. 78 FR 7306 (Feb. 1, 2013). In the January 2013 Framework Document, DOE also requested feedback from interested parties generally on issues related to test methods for evaluating the energy efficiency of commercial and industrial fans and blowers (January 2013 Framework Document at pp. 16-25).

In the January 2013 Framework Document DOE determined that it lacks authority to establish energy conservation standards for fume hoods because fume hoods are not listed as a type of equipment for which DOE could establish standards (January 2013 Framework Document at p. 15). DOE acknowledged that the fan that provides ventilation for the fume hood consumes the largest portion of energy within the fume

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<sup>4</sup> *Energy Conservation Standards Rulemaking Framework for Commercial and Industrial Fans and Blowers* ("January 2013 Framework Document") is included in Docket EERE-2013-BT-STD-0006 and available at [www.regulations.gov/document?D=EERE-2013-BT-STD-0006-0001](http://www.regulations.gov/document?D=EERE-2013-BT-STD-0006-0001).

hood system, and that DOE planned to cover all commercial and industrial fan types, which includes fans used to ventilate fume hoods. *Id.*

On December 10, 2014, DOE published a notice of data availability that presented a provisional analysis estimating the economic impacts and energy savings from potential energy conservation standards for certain fans and blowers. 79 FR 73246.

On April 1, 2015, DOE published a notice of intent to establish a negotiated rulemaking working group under the Appliance Standards and Rulemaking Federal Advisory Committee (hereafter referred to as the “Working Group”) to negotiate proposed definitions, and, as applicable, certain aspects of a proposed test procedure and proposed energy conservation standards for fans and blowers. 80 FR 17359. On May 1, 2015, DOE published a second notice of data availability of a revised provisional analysis of the potential economic impacts and energy savings that could result from promulgating an energy conservation standard for commercial and industrial fans and blowers. 80 FR 24841 (“May 2015 NODA”).

The Working Group<sup>5</sup> negotiations comprised 16 meetings and three webinars and covered scope, metrics, test procedures, and energy conservation standard levels for fans and blowers.<sup>6</sup> The Working Group concluded its negotiations on September 3, 2015, and

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<sup>5</sup> The Working Group was comprised of representatives from AAON, Inc.; AcoustiFLO LLC; AGS Consulting LLC; AMCA; AHRI, Appliance Standards Awareness Project; Berner International Corp; Buffalo Air Handling Company; Carnes Company; Daikin/Goodman; ebm-papst; Greenheck; Morrison Products; Natural Resources Defense Council; Newcomb & Boyd; Northwest Energy Efficiency Alliance; CA IOUs; Regal Beloit Corporation; Rheem Manufacturing Company; Smiley Engineering LLC representing Ingersoll Rand/Trane; SPX Cooling Technologies / CTI; The New York Blower Company; Twin City Companies, Ltd; U.S. Department of Energy; and United Technologies/Carrier

<sup>6</sup> Details of the negotiation sessions can be found in the public meeting transcripts that are posted to the docket for the energy conservation standard rulemaking at: [www.regulations.gov/docket?D=EERE-2013-BT-STD-0006](http://www.regulations.gov/docket?D=EERE-2013-BT-STD-0006).

approved by consensus vote<sup>7</sup> a term sheet containing recommendations for DOE on scope, energy conservation standards, and a test procedure for the subject industrial equipment. The term sheet containing the Working Group recommendations is available in the commercial and industrial fans and blowers energy conservation standard rulemaking docket. (Docket No. EERE-2013-BT-STD-0006, No. 179) ASRAC approved the term sheet on September 24, 2015. (Docket No. EERE-2013-BT-NOC-0005; Public Meeting Transcript, No. 58, at p. 29) On November 1, 2016, DOE published a third notice of data availability (“November 2016 NODA”) that presented a revised analysis based on the scope and metric recommendations of the term sheet. 81 FR 75742.

On January 10, 2020, DOE received a petition from the Air Movement and Control Association, International (“AMCA”), Air Conditioning Contractors of America, and Sheet Metal & Air Conditioning Contractors of America requesting that DOE establish a Federal test procedure for certain categories of fans based on an upcoming industry test method, AMCA Standard 214, “Test Procedure for Calculating Fan Energy Index (FEI) for Commercial and Industrial Fans and Blowers” DOE published a notice of petition and request for public comment (“April 2020 Notice of Petition”). 85 FR 22677 (Apr. 23, 2020). AMCA, Air Conditioning Contractors of America, and Sheet Metal & Air Conditioning Contractors have since withdrawn their petition (AMCA, No.12, at p. 1).<sup>8</sup>

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<sup>7</sup> At the beginning of the negotiated rulemaking process, the Working Group defined that before any vote could occur, the Working Group must establish a quorum of at least 20 of the 25 members and defined consensus as an agreement with less than 4 negative votes. Twenty voting members of the Working Group were present for this vote. Two members (Air-Conditioning, Heating, and Refrigeration Institute and Ingersoll Rand/Trane) voted no on the term sheet.

<sup>8</sup> The parenthetical reference provides a reference for information located in DOE Docket No. EERE-2011-BT-DET-0045. The references are arranged as follows: (commenter name, comment docket ID number, page of that document). If one comment was submitted with multiple attachments, the references are

In preparation for this notice, on May 10, 2021, DOE published a request for information requesting comments on a potential fan or blower definition. 86 FR 24752 ("May 2021 RFI").

On February 14, 2020, DOE published in the *Federal Register* a final rule which updated the procedures, interpretations, and policies that DOE will follow in the consideration and promulgation of new or revised appliance energy conservation standards and test procedures under EPCA. 85 FR 8626; see also 10 CFR part 430, subpart C, appendix A (*i.e.*, "Process Rule"). The updated Process Rule establishes the process DOE must follow when undertaking a determination of whether industrial equipment should be covered under EPCA. Section 5 of the Process Rule. Pursuant to the updated Process Rule, if DOE determines to initiate the coverage determination process, it will first publish a notice of proposed determination, providing an opportunity for public comment of not less than 60 days, in which DOE will explain how coverage of the equipment type that it seeks to designate as "covered" is "necessary" to carry out the purposes of EPCA. Section 5(b) of the Process Rule. DOE will publish its final decision on coverage as a separate notice, an action that will be completed prior to the initiation of any test procedure or energy conservation standards rulemaking (*i.e.*, DOE will not issue any requests for information, notices of data availability, or any other mechanism to gather information for the purpose of initiating a rulemaking to establish a test procedure or energy conservation standard for the proposed covered equipment prior to finalization of the coverage determination). Section 5(c) of the Process Rule.

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arranged as follows: (commenter name, comment docket ID number, attachment number, page of that document). The attachment number corresponds to the order in which the attachment appears in the docket. If the information was submitted to a different DOE docket, the DOE Docket number is additionally specified in the reference.



Because this coverage determination was already in progress at the time the revised Process Rule was published, DOE is applying those provisions moving forward (*i.e.*, rather than reinitiating the entire rulemaking process). To date, DOE has not proposed test procedures or energy conservation standards for fans and blowers.

## II. General Discussion

DOE developed this determination after considering comments, data, and information from interested parties that represent a variety of interests. Table II-1 lists the interested parties that have provided comments on the January 2013 Framework,<sup>9</sup> June 2011 NOPD, April 2020 Notice of Petition,<sup>10</sup> and May 2021 RFI relevant to the coverage determination.

**Table II-1 January 2013 Framework, June 2011 NOPD, April 2020 Notice of Petition, and May 2021 RFI Written Comments**

Organization(s)	Reference in this NOPR	Organization Type	January 2013 Framework	June 2011 NOPD	April 2020 Notice of Petition	May 2021 RFI
Air Movement and Control Association International	AMCA	Trade Association		X		X
Air-Conditioning, Heating, and Refrigeration Institute	AHRI	Trade Association	X	X	X	X
Appliance Standards Awareness Project, American Council for an Energy-Efficient Economy, National Consumer Law Center, and Natural Resources Defense Council	Efficiency Advocates	Efficiency Organizations		X		
Appliance Standards Awareness Project/National Research Defense Council	ASAP/NRDC	Efficiency Organization				X
Appliance Standards	ACEEE et al.	Efficiency	X			

<sup>9</sup> DOE Docket No. EERE-2013-BT-STD-0006

<sup>10</sup> DOE Docket No. EERE-2020-BT-PET-0003

Awareness Project, Northwest Energy Efficiency Alliance, Natural Resources Defense Council, and Alliance to Save Energy		Organization				
China World Trade Organization, Technical Barriers to Trade National Notification and Enquiry Center	China WTO/TBT	Government Entity		X		
Cooling Technology Institute	CTI	Trade Association				X
Daikin Applied	Daikin	Manufacturer			X	
Ebm-papst Inc	Ebm-papst	Manufacturer	X	X		X
Edison Electric Institute	EEI	Utility	X			
Greenheck Group	Greenheck	Manufacturer				X
Ingersoll Rand/Trane	Ingersoll Rand/Trane	Manufacturer	X			
Johnson Controls	Johnson Controls	Manufacturer			X	
Lennox International Inc.	Lennox	Manufacturer	X		X	
Marley Engineered Products LLC	MEP	Manufacturer				X
Morrison Products Inc.	Morrison Products	Manufacturer	X			
Northwest Energy Efficiency Alliance	NEEA	Efficiency Organizations		X		
Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company	PG&E, SCE, SDG&E	Utility				X
Pacific Gas and Electric Company, San Diego Gas and Electric, Southern California Gas Company, and Southern California Edison	CA IOUs	Utility	X	X		

The comments received specific to the fan and blower definition, fan and blower coverage, and DOE's decision regarding a definition and coverage for fans and blowers are discussed in the paragraphs that follow. However, DOE does not reference or respond to comments made by interested parties regarding issues that are outside the scope of this final determination (*e.g.*, comments related to potential energy conservation

standards and test procedures). The comments from interested parties and term sheet recommendations related to the test procedures and energy conservation standards will be addressed separately as part of any potential rulemaking for establishing test procedures and energy conservation standards for fans and blowers. Further, comments related to fume hoods are not discussed in this final determination as DOE has determined it does not have the statutory authority to include fume hoods as covered equipment.

#### *A. Definition and Scope of Coverage*

Although EPCA lists fans and blowers as types of equipment that may be defined as industrial equipment, these terms are not defined. (*See* 42 U.S.C. 6311(2)(B)(ii) and (iii)) As noted, DOE proposed definitions for “fan” and “blower” in the June 2011 NOPD.<sup>11</sup> 76 FR 37678, 37679. Specifically, DOE proposed the following definitions:

*A fan* is an electrically powered device used in commercial or industrial systems to provide a continuous flow of a gas, typically air, for ventilation, circulation, or other industrial process requirements. Fans are classified as axial or centrifugal. Axial fans move an airstream along the axis of the fan. Centrifugal fans generate airflow by accelerating the airstream radially. A fan may include some or all of the following components: motor and motor controls, rotor or fan blades, and transmission and housing.

*A blower* is a type of centrifugal fan.

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<sup>11</sup> DOE also proposed a definition of “fume hood,” but as discussed DOE has determined it does not have statutory authority to include fume hoods as covered equipment.

*Id.*

In response to the June 2011 NOPD, the CA IOUs encouraged DOE to consult test procedures of AMCA, American Society of Heating, Refrigeration and Air-Conditioning Engineers (“ASHRAE”), and National Fire Protection Association, as well as any other test procedures that may be relevant to this rulemaking. They also encouraged DOE to develop a more robust definition for blowers suggesting that fans and blowers are differentiated by the method used to move the air and by the system pressure they must operate against. The CA IOUs recommended DOE rely on specific ratios of the discharge pressure over the suction pressure, to define fans and blowers. The CA IOUs also urged DOE to ensure that the definitions for fans do not overlap with residential air handlers or commercial packaged air conditioning units. (CA IOUs, No. 6, at pp. 3-5).

In response to the June 2011 NOPD, NEEA asked whether the proposed definition of “fan” included mixed flow fans which have aspects of both an axial and centrifugal fan, citing a tubular centrifugal fan as an example of this type of fan. NEEA also asked whether the proposed definition of “blower” would include mixed flow blowers that have aspects of both an axial and centrifugal fan and are frequently used for laboratory exhaust applications. (NEEA, No. 5, at p. 1-2). The Efficiency advocates encouraged DOE to cover mixed flow fans (Efficiency advocates, No. 4, at p. 3).

In response to the June 2011 NOPD, AMCA commented generally that the proposed definitions of fans and blowers were not consistent with the established fan industry definitions and recommended that DOE adopt the relevant industry standards (AMCA, No. 7, at p. 3).

Taking into consideration the comments received to the June 2011 NOPD, in the January 2013 Framework Document, DOE considered the following definitions for “fan” and “blower:”

*Commercial/Industrial Fan:* A device used in commercial or industrial systems to provide a continuous flow of a gas, typically air, by an impeller fit to a shaft and bearing(s). A fan may be manufactured with or without a housing component.

*Blower:* An axial or centrifugal fan with a specific ratio between 1.11 and 1.20.

(January 2013 Framework Document at pp. 7 and 9)

DOE also acknowledged that the terms “fan” and “blower” are used interchangeably by the industry. (January 2013 Framework Document at p. 9)

In response to the January 2013 Framework Document, the CA IOUs commented that AMCA 99-10, “Standards Handbook”<sup>12</sup> included a fan definition and that the American Society of Mechanical Engineers (“ASME”) relied on specific ratios of the total pressure at the outlet of the equipment over the total inlet pressure to distinguish between fans, blowers, and compressors. The CA IOUs commented that DOE should ensure the definitions for fans, blowers, and compressors<sup>13</sup> are aligned to prevent any loopholes. (Docket No. EERE-2013-BT-STD-0006; CA IOUs, No. 11, at p.3) Morrison Products commented that while the industry used the terms fan and blower

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<sup>12</sup> ANSI/AMCA Standard 99-10: Standards Handbook. Available at [www.amca.org](http://www.amca.org).

<sup>13</sup> Fans and compressors are equipment used to move amounts of gas (generally air). A fan moves gas with a low increase in pressure while a compressor moves gas with a high increase in pressure. DOE established a definition of compressor as follows: a machine or apparatus that converts different types of energy into the potential energy of gas pressure for displacement and compression of gaseous media to any higher pressure values above atmospheric pressure and has a pressure ratio at full-load operating pressure greater than 1.3. See 10 CFR 431.342

interchangeably, they recommend using the ASME terminology. (Docket No. EERE-2013-BT-STD-0006; Morrison Products, No. 15, at p.5) AMCA commented that the terms fan and blower were used interchangeably and suggested a definition for the term fan.<sup>14</sup> (Docket No. EERE-2013-BT-STD-0006; AMCA, No. 19, at pp.4, 43) The American Council for an Energy-Efficient Economy and other efficiency organizations<sup>15</sup> ("ACEEE, et al.) commented in support of establishing a broad definition for fans and then specify which fans should be excluded from coverage, as this approach is more administrable and less subject to unintended loopholes. ACEE, et al, also commented that the a distinction between fans, blowers, and compressors has not been established. (Docket No. EERE-2013-BT-STD-0006; ACEEE, et al. ; No. 25, at p. 3) In response to the January 2013 Framework Document, ebm-papst commented that the terms "commercial" and "industrial" would require further clarification and that a fan definition should rely on physical features (e.g. size, performance, construction). Ebm-papst noted that in Europe, an impeller fitted to a shaft and bearing is not considered a "fan". Rather the entity that combines the impeller with an electric motor is considered the fan manufacturer. (Docket No. EERE-2013-BT-STD-0006; emb-papst, No. 20, at p.6) Emb-papst added a fan description from the European Ventilation Industry Association which describes a fans as : " A fan is a combination of an impeller(s) and motor. It may also include a housing, mechanical drive and a variable speed drive." (Docket No. EERE-2013-BT-STD-0006; emb-papst, No. 20, at p.8)

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<sup>14</sup> AMCA recommended defining fan as a rotary bladed machine designed to convert mechanical power to air power in order to maintain continuous flow from the inlet(s) to outlet(s). Energy output is limited to 25 kJ/kg of air. A fan contains the following basic components: (a) Impeller(s): Rotary bladed aerodynamic component responsible for the total energy increase of the airstream delivered by the fan; (b) Fan Structure: Any integral component(s) necessary to support the impeller, alter(s) the energy-composition of the airstream, or direct(s) flow into or out of the impeller. These components must be present when testing to develop performance ratings of the fan; (c) Inlet: Surface(s) bounded by a portion of the fan structure across which air enters the fan; (d) Outlet: Surface(s) bounded by a portion of the fan structure from which air exits the fan. (Docket No. EERE-2013-BT-STD-0006; AMCA, No. 19, at p. 43)

<sup>15</sup> Appliance Standards Awareness Project, Northwest Energy Efficiency Alliance, Natural Resources Defense Council, and Alliance to Save Energy.

Consistent with DOE's acknowledgement, the Working Group commented that the terms "fan" and "blower" are used interchangeably in the U.S. market and suggested eliminating the term "blower" to avoid potential confusion. (Docket No. EERE-2013-BT-STD-0006; Public Meeting Presentation, No. 106, at p.47) To the extent that a blower would meet the criteria in the proposed definition, it is a fan. As such, DOE is not considering further a separate definition for "blower."

DOE reviewed existing industry standards to compare how industry standards define the terms fan and blower and distinguish this equipment from compressors. AMCA 99-10<sup>16</sup> includes an energy limit of 25 kilojoule ("kJ")/kilogram ("kg") of air<sup>17</sup> in its fan definition. As discussed, the specific ratio is often used to separate fans (specific ratio less than or equal to 1.11), blowers (specific ratio greater than 1.11 and less than or equal to 1.20), and compressors (specific ratio greater than 1.20), however, ASME states that this distinction in common practice is imprecise.<sup>18</sup> The ISO 13349:2010, "Fans – Vocabulary and definitions of categories"<sup>19</sup> defines fans based on a maximum energy limit of 25 kJ/kg of air and indicates that this is equivalent to a specific ratio of 1.3. DOE presented this information to the Working Group. (Docket No. EERE-2013-BT-STD-0006; Public Meeting Presentation, No. 106, at p. 47). Subsequently, the Working Group developed a draft definition of fan as follows: "a rotary bladed machine used to convert power to air power with an energy output limited to 25 kJ/kg of air; typically consisting of an impeller, a shaft, bearings, a structure or housing, transmission, driver, and control if included by the manufacturer at the time of sale". The Working Group noted that this

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<sup>16</sup> ANSI/AMCA Standard 99-10: Standards Handbook. Available at [www.amca.org](http://www.amca.org).

<sup>17</sup> This value characterizes the increase in pressure of the air being moved by the fan. An energy output of 25 kJ/kg is equivalent to a pressure ratio of 1.3. For an air density of 1.2 kg/m<sup>3</sup>, the fan pressure is  $1.2 \times 25 \text{ kJ/kg}$ , *i.e.* 30 kPa, and the pressure ratio is calculated as  $(100+30)/100 = 1.30$  (where atmospheric pressure = 100 kPa).

<sup>18</sup> ASME PTC 11-2008 Standard: Fans. Available at [www.asme.org](http://www.asme.org).

<sup>19</sup> ISO 13349:2010 Fans — Vocabulary and definitions of categories. Available at [www.iso.org](http://www.iso.org).

definition was still a work in progress and that AMCA would consult its technical committee to confirm the value used to characterize the energy output limit (Docket No. EERE-2013-BT-STD-0006; Public Meeting Presentation, No. 106, at pp. 45, 47).

Subsequently, AMCA's fan technical committee commented in support of the Working Group's definition. (Docket No. EERE-2013-BT-STD-0006; AMCA, No. 74, at p. 1) This definition was later included as a draft working definition in a draft term sheet with some modifications as follows: "a rotary bladed machine used to convert power to air power, with an energy output limited to 25 kJ/kg of air, consisting of an impeller, a shaft, bearings, and a structure or housing; and includes any transmissions, driver, and/or controls if integrated, assembled, or packaged by the manufacturer at the time of sale." (Docket No. EERE-2013-BT-STD-0006; Draft Term Sheet, No. 143 at p. 1) The approved term sheet did not include a recommended definition of "fan," as the definition established by the Working Group was still considered a draft definition at the time. (Docket No. EERE-2013-BT-STD-0006; Public Meeting Transcript, No. 165 at p. 76) Ingersoll Rand/Trane, commented in support of the fan definition as drafted by the Working Group (Docket No. EERE-2013-BT-STD-0006; Ingersoll Rand/Trane, No. 153 at p. 6).

A recent industry test procedure, AMCA 214-21,<sup>20</sup> includes a definition similar to that drafted by the Working Group. AMCA 214-21 defines a fan as follows: "a rotary bladed machine used to convert electrical or mechanical power to air power, with an energy output limited to 25 kJ/kg of air. It consists of an impeller, a shaft and bearings

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<sup>20</sup> ANSI/AMCA 214-21, Test Procedure for Calculating Fan Energy Index (FEI) for Commercial and Industrial Fans and Blowers. ("AMCA 214-21")



and/or driver to support the impeller, as well as a structure or housing. A fan may include a transmission, driver, and/or motor controller.”

In the May 2021 RFI, DOE requested comments on this definition and the potential addition of the descriptor “commercial and industrial” with the term "fan" to clarify that the subject fans are industrial equipment and that the term excludes ceiling fans and furnace fans, both covered products defined at 10 CFR 430.2. In the May 2021 RFI, DOE also initially determined that the terms "fan" and "blower" can be used interchangeably. 86 FR 24752, 24754.

In response to the May 2021 RFI, ASAP/NRDC supported the adoption of the AMCA 214-21 definition of fan as the definition for commercial and industrial fans. (ASAP/NRDC, No. 14, at p. 1) PG&E, SCE, SDG&E also commented in support of this definition. In addition, PG&E, SCE, SDG&E commented that the AMCA 214-21 fan definition included an energy output limit of 25 kJ/kg of air which is appropriate to distinguish a fan from a compressor (PG&E, SCE, SDG&E, No. 17, at pp. 1-2). Further, PG&E, SCE, SDG&E noted that the definition for fans in AMCA 214-21 includes the option (but not the requirement) for a motor controller and is not specific to electrically-driven equipment. PG&E, SCE, SDG&E, also noted that the definition does not specify a fan flow angle and includes centrifugal, axial, and mixed-flow blade orientations (i.e., what are commonly referred to as “blowers”). (PG&E, SCE, SDG&E, No. 17, at p. 2). AMCA, Greenheck, and ebm-papst supported the definition of fan in AMCA 214-21 and further verified that they consider the terms “fan” and “blower” to be interchangeable (AMCA, No. 12, at p. 3; ebm-papst, No. 19, at p. 1; Greenheck, No. 18, at p. 1). AMCA also supported DOE’s position that the definition of compressor in the compressor regulation sufficed to differentiate fans from compressors. (AMCA, No. 12, at p. 3) Ebm-

papst stated that limiting the energy output to 25 kJ/kg of air on the fan definition is appropriate to distinguish a fan from a compressor (ebm-papst, No. 19, at p. 1). In addition, AMCA commented that fans that use steam, combustion, or drivers other than electric motors suitable to be powered by the electricity “grid” should be exempted from any future DOE regulation. (AMCA, No.12, at p.2)

DOE is establishing a definition for fan or blower, which provides the scope of coverage of the final determination, and is identical to the definition of “fan” in AMCA 214-21. DOE has determined that the terms “fan” and “blower” are used interchangeably in the U.S. market and therefore applies the same definition to the terms “fan” and “blower” (also referred to collectively as “fan” in the remainder of this final determination).

DOE notes that the maximum energy limit of 25 kJ/kg of air is equivalent to a pressure ratio of 1.3.<sup>21</sup> The value of 1.3 matches the pressure ratio used in the definition of compressor at 10 CFR 431.342. Based on the comments from interested parties and on the existing DOE definition of “compressor,” DOE concludes that the maximum fan energy limit of 25 kJ/kg is appropriate to distinguish fans from compressors and is adopting this upper limit in the definition.

With regard to the criterion that a fan must convert “electrical and mechanical power into air power,” fans that are powered by an engine or any other driver would meet this criterion as the engine or other driver would be providing mechanical power that is converted into air power. Inclusion of the term "mechanical" covers fans that are sold

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<sup>21</sup> For an air density of 1.2 kg/m<sup>3</sup>, the fan pressure is  $1.2 \times 25$  kJ/kg, i.e. 30 kPa, and the pressure ratio is calculated as  $(100+30)/100 = 1.30$  (where atmospheric pressure = 100 kPa).

without an electric motor or other driver and which convert mechanical power into airpower.

In response to the May 2021 RFI, Ebm-papst agreed that the "fan" definition in AMCA 214-21 is appropriate for the coverage determination and commented that the "commercial and industrial fan" definition, as based on the AMCA 214-21 fan definition, should include circulating fans that are not ceiling fans as defined at 10 CFR 430.2. (ebm-papst, No. 19, at p. 1) PG&E, SCE, SDG&E commented that including the terms "commercial and industrial" with "fan" would limit confusion with residential products, i.e. circulating fans and furnace fans. (PG&E, SCE, SDG&E, No. 17, at p.2) CTI generally supported the adoption of the AMCA 214-21 definition of fan as the definition for commercial and industrial fans but asserted that the definition was unclear as to which fans would fall within DOE's scope of coverage. CTI explained that they were neutral on the term "commercial and industrial" to further describe fans, but expressed concern with the fans that could fall under such descriptor. In addition, CTI expressed concerns that embedded fans were not explicitly excluded from the scope of AMCA 214-21, only its foreword, and thought that embedded fans should be specifically excluded from the scope of AMCA 214-21. (CTI, No. 13, pp. 1-2) AMCA recommended that ceiling fans and furnace fans be explicitly excluded from the scope of any potential DOE regulation because of the existing regulations of those products. (AMCA, No. 12, at p.3)

While generally supporting use of the AMCA 214-21 definition as the DOE definition for "fan", AHRI expressed that "commercial and industrial" had a "special meaning" not identical to the 214-21 definition of fan and that that required further elaboration by DOE. AHRI recommended that the definition for "commercial and industrial fan" needs to make clear that fans within scope are industrial equipment,

including commercial fans per 42 U.S.C. 6311(2), and exclude ceiling fans, furnace fans, and fans embedded in other consumer products. (AHRI, No. 16.2, at p. 2). AHRI also suggested a definition for “commercial and industrial fans” that would exclude equipment that utilizes single-phase electricity and exclude equipment with a rated fan shaft power less than or equal to 1 hp (or fan electrical input power above 0.89 kilowatts), and listed specific equipment categories containing fans for which AHRI recommends exclusions (AHRI, No. 16.1, at p.1; 16.2, at pp. 2, 3). AHRI asserted that collectively these exclusions would be consistent with the scope of the AMCA 214-21 test procedure, the scope of the test procedure as recommended in the petition presented in the April 2020 Notice of Petition, and the scope of the test procedure and energy conservation standards as recommended by the Working Group. AHRI also expressed concern that manufacturers of DOE regulated equipment that contain commercial and industrial fans would be subject to double regulations. (AHRI, No. 16.2, at p. 3). Ebm-papst, while stating its support of the AMCA 214-21 “fan” definition for use in DOE’s coverage determination, also suggested that furnace fans and ceiling fans, as defined in 10 CFR 430.2, should be specifically excluded in the “commercial and industrial fan” definition and commented that fans operating at three-phase or rated at greater than 127 volts would typically be considered as commercial and industrial fans (ebm-papst, No. 19, at p.1). MEP recommended that the definition for a commercial and industrial fan should include a requirement for polyphase electric current with a fan shaft power greater than 3 hp, to avoid including “residential fans” in regulations. (MEP, No. 15, at p. 1). AMCA commented that the scope of any potential DOE regulation should be based on a lower shaft power limit of 1 horsepower to align with ASHRAE 90.1-2019 and the 2021 International Energy Conservation Code. (AMCA, No.12, at p. 3)

While generally supporting use of the AMCA 214-21 definition as the DOE definition for “fan”, Greenheck recommended establishing a separate definition for fans that are embedded in a manufactured assembly where the assembly includes functions other than air movement require further definition that considers the utility, function and overall energy consumption and efficiency of the manufactured assembly. (Greenheck, No. 18, p. 1) MEP also recommended that DOE establish a separate definition for embedded fans as provided by AMCA 214-21 and to make clear that embedded fans are not included in the definition of “fans.” (MEP, No. 15, at p. 1) CTI commented that the majority of fan energy savings derive from standalone fans as opposed to embedded fans. CTI commented that an exemption for fans used in heat rejection equipment is appropriate because the overall performance of the heat rejection equipment is the key metric and not the performance of the individual fan component. (CTI, No. 13, at p.2)

In response to the April 2020 Notice of Petition, DOE received a number of comments relevant to the scope of the determination. AHRI commented that DOE should initiate a new coverage determination process and that the final scope of coverage should be limited to stand-alone fans. AHRI commented that HVACR and water heating equipment is built, tested, rated, and certified as a completed design; and that modifying a component, including fans, would change the performance of the equipment. AHRI commented that energy conservation standards could create a safety issue for replacement fans in equipment to the extent that compliance with safety and performance standards could be affected by a change in the fan performance. (Docket No. EERE-2020-BT-PET-0003; AHRI, No. 14 at p. 3)<sup>22</sup> Daikin commented in support of AHRI’s comment. (Docket No. EERE-2020-BT-PET-0003; Daikin, No. 8 at p. 1) Lennox similarly

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<sup>22</sup> As previously discussed, AHRI repeated these arguments in response to the May 2021 RFI.

opposed regulating fans that are components of HVACR equipment. (Docket No. EERE-2020-BT-PET-0003; Lennox, No. 5 at pp. 2-3)

In response to the April 2020 Notice of Petition, Johnson Controls commented in support of initiating a coverage determination for commercial and industrial fans and blower products within the same scope and noted exemptions of the petition by AMCA, the Air Conditioning Contractors of America, and the Sheet Metal & Air Conditioning Contractors of America. Johnson Controls commented that they strongly oppose any regulatory measures aimed at fans that are components of heating, ventilation, and air conditioning (“HVAC”) equipment where the primary purpose of the equipment is to heat or cool a space, and for which there are already well-established equipment-level energy efficiency. (Docket No. EERE-2020-BT-PET-0003; Johnson Controls, No. 10 at p. 1)

In this final rule, DOE is no longer including the description "commercial and industrial" with the term "fan", since DOE has determined that this language is redundant, given the statutory definition of "industrial equipment" in 42 U.S.C. 6311(2). In addition, as noted above, comments also raised questions as to whether including “commercial and industrial” would provide more clarity or provoke more uncertainty. The definition of "industrial equipment" explicitly excludes covered products, other than a component of a covered product. (42 U.S.C. 6311(2)(A)(iii)) Therefore, the inclusion of "commercial and industrial" is not necessary to clarify the exclusion of ceiling fans and furnace fans, both covered products defined at 10 CFR 430.2.

While fans would typically operate on three-phase power and not on single-phase power, this criterion does not necessarily distinguish a fan as industrial equipment, because some fans are sold without a motor (making it impossible to determine whether they would be operated on single-phase or three-phase power) and some fans could

potentially be operated with either a three-phase or single-phase motor. As such, DOE is not including a phase criterion as part of the definition since it does not sufficiently distinguish a fan as industrial equipment.

Further, while larger fans (i.e., fans with higher fan shaft input power) are typically used in commercial and industrial applications, some with lower fan shaft input power are also used in smaller commercial and industrial applications. Because nothing would formally prevent the use of a fan with a lower shaft input power in commercial and industrial applications, DOE is not using shaft input power in defining fans and finds the definition as-is will provide sufficient demarcation between industrial equipment and consumer products. DOE may consider fan shaft power when establishing the scope for potential fan test procedures and energy conservation standards.

Commenters raised concerns that including embedded fans would produce overlapping standards and create multiple standard cycles, and questioned how DOE would evaluate performance of embedded fans that work as a component of a system. As discussed, the statutory definition of “industrial equipment” generally excludes covered products, but does not exclude the component of covered products. EPCA explicitly provides that industrial equipment can be a component of a covered product if the Secretary determines in a rule that such equipment is to a significant extent, distributed in commerce other than as component parts for consumer products and such equipment otherwise meets the definition of industrial equipment. (42 U.S.C. 6311(2)(A)(iii); 42 U.S.C. 6312(c)) While some fans that meet the definition of “fan” as defined in this Final Determination may be component parts of consumer products, not all fans as defined are such. Therefore, whether a fan is embedded is not a criterion that can be reliably used to identify “fans”.

While some commenters recommended specific exclusions from the fan definition, as stated and discussed in detail in section II.B, DOE has determined that fans as defined in this final determination and without further exclusions qualify as “covered equipment” under part A-1 of Title III of EPCA. (*See* 42 U.S.C. 6311(2)(A) and 42 U.S.C. 6312(b)) This final determination does not establish test procedures or energy conservation standards for fans. In evaluating potential test procedures and energy conservation standards, DOE will consider the extent to which any such test procedures or standards are appropriate and justified for specific fans.

Based on the foregoing discussion, DOE is establishing the term “fan” to mean a rotary bladed machine used to convert electrical or mechanical power to air power, with an energy output limited to 25 kilojoule (kJ)/ kilogram (kg) of air. It consists of an impeller, a shaft, and bearings and/or driver to support the impeller, as well as a structure or housing. A fan may include a transmission, driver, and/or motor controller. DOE is applying the same definition to the term “blower”.

#### *B. Evaluation of Fans and Blowers as Covered Equipment*

As stated previously and discussed in detail in the following paragraphs, DOE has determined that fans (*i.e.*, fans and blowers) meet the criteria for inclusion as “covered equipment.” (*See* 42 U.S.C. 6311(2)(A) and 42 U.S.C. 6312(b))

In response to the April 2020 Notice of Petition, AHRI commented that any final coverage determination that would rely on the analysis performed during the ASRAC process would not be appropriate given concerns related to the fan performance data used which was not certified performance data and was not confirmed to be reflective of fans that are components of HVACR and water heating equipment. (Docket No. EERE-2020-



BT-PET-0003; AHRI, No. 14 at p. 3) Lennox commented that the June 2011 NOPD analysis lacked specificity and that DOE should account for the findings of the Working Group. (Docket No. EERE-2020-BT-PET-0003; Lennox, No.5 at p. 2)

The November 2016 NODA analysis included market and technical information to characterize and evaluate the impacts of potential standards on certain embedded fans. 81 FR 75742,75751. As presented and discussed in detail in sections II.B.1, II.B.2, and II.B.4 of this document, DOE has updated its analysis to account for the findings of the Working Group and additional information collected after the publication of the November 2016 NODA.

As noted, EPCA provides that “covered equipment” includes any other type of industrial equipment which the Secretary classifies as covered equipment for which the Secretary has determined coverage is necessary to carry out the purpose of Part A-1. 42 U.S.C. 6311(1)(L). “Industrial equipment” is any article of specifically listed equipment that is of a type, which (1) in operation consumes, or is designed to consume, energy; (2) to any significant extent, is distributed in commerce for industrial or commercial use; (3) is not a “covered product,” and (4) for which the Secretary has determined coverage is necessary to carry out the purpose of Part A-1. (42 U.S.C. 6311(2)(A); 42 U.S.C. 6312(b))

EPCA lists fans (*i.e.*, fans and blowers) among the equipment that may be industrial equipment. (42 U.S.C. 6311(2)(B)(ii) and (iii)) DOE addresses the requirements for determining that fans are “industrial equipment” and “covered equipment” in the following paragraphs.

#### 1. Energy Consumption in Operation

To qualify as “industrial equipment” fans and blowers must be of a type which in operation consumes, or is designed to consume, energy. (42 U.S.C. 6311(2)(A)(i))

In the 2011 NOPD, DOE used information from the 2009 U.S. Energy Information Administration (“EIA”) Annual Energy Outlook (“AEO”) to estimate the total energy consumption of equipment covered under the then proposed definitions of fan and blower in the commercial sector.<sup>23</sup> DOE also used the 2009 EIA Manufacturing Energy Consumption Survey to estimate the total electricity consumption of the industrial sector. DOE then used information on the percentage of fan and blower electricity use in industry from an American Council for an Energy-Efficient Economy study<sup>24</sup> to calculate fan and blower electricity use in the industrial sector. DOE estimated that “commercial fans and blowers” consumed 139,533 million kWh of electricity per year while “industrial fans and blowers” consumed 90,057 million kWh of electricity per year. 76 FR 37678, 37979.

In response to the 2011 NOPD and the May 2021 RFI, AHRI commented that the energy consumption estimate provided by DOE was based on outdated data and did not account for energy saving measures required by the major energy building codes in the U.S. AHRI stated that ASHRAE Standard 90.1-2010 *Energy Standard for Buildings Except Low-Rise Residential Building* (“ASHRAE Standard 90.1”) includes limits on the energy consumption of commercial fans and has been adopted in most states. (AHRI, No. 3, at pp. 2-3)

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<sup>23</sup> DOE used AEO’s estimate of total energy consumption in commercial buildings by end use (e.g. lighting, cooking, and office equipment) and selected “ventilation” as the representative end use for fans as this equipment is used to provide building ventilation.

<sup>24</sup> Energy Efficiency and Electric Motors, Report PB-259 129, A.D. Little, Inc. 1976., U.S. Federal Energy Administration, Office of Industrial Programs. Springfield, VA: National Technical Information Service.

For this final determination, DOE updated its analysis to include information from a 2021 DOE study to estimate the amount of motor electricity use represented by fans and blowers in the industrial and commercial sectors.<sup>25</sup> Based on this study, DOE estimates that fans and blowers consume 192,085 million kWh of electricity per year in the commercial sector and 112,942 million kWh of electricity per year in the industrial sector.

Both the estimates from the June 2011 NOPD and the updated estimates demonstrate that fans and blowers consume energy in operation. Therefore, DOE concludes that fans and blowers satisfy the first element of “industrial equipment” required by 42 U.S.C. 6311(2)(A)(i).

## 2. Distribution in Commerce

To qualify as “industrial equipment” fans and blowers must be, to a significant extent, distributed in commerce for industrial and commercial use.<sup>26</sup> (42 U.S.C. 6311(2)(A)(ii))

DOE published shipments estimates for certain varieties of fans to support the November 2016 NODA analysis. The November 2016 NODA analyzed a subset of fans operating with a shaft input power equal to or greater than 1 horsepower and fan air power equal to or less than 150 horsepower as recommended in the term sheet.

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<sup>25</sup> U.S. Department of Energy (January 2021), *United States Industrial and Commercial Motor System Market Assessment Report. Volume 1: Characteristics of the Installed Base*. Retrieved February 2, 2021, from [eta-publications.lbl.gov/sites/default/files/u.s.\\_industrial\\_and\\_commerical\\_motor\\_system\\_market\\_assessment\\_report\\_vol\\_1\\_.pdf](https://eta-publications.lbl.gov/sites/default/files/u.s._industrial_and_commerical_motor_system_market_assessment_report_vol_1_.pdf)

<sup>26</sup> DOE notes that distribution for residential use does not preclude coverage as covered equipment so long as to a significant extent the equipment is of a type that is also distributed in commerce for industrial and commercial use.

Generally, the scope excluded certain fans used in HVACR equipment subject to DOE energy conservation standards and specific categories of fans such as safety fans. 81 FR 75742, 75745-75746 (Docket No. EERE-2013-BT-STD-0006; No. 179, Recommendation #1, 2, 3, 5, at pp.1-4)

In the November 2016 NODA, DOE estimated annual shipments of fans in scope of the analysis to be 1.18 million with approximately 18 percent for use in industrial applications and 82 percent for use in commercial applications. (Docket No. EERE-2013-BT-STD-0006; National Impact Analysis Spreadsheet, No. 192) The shipments of all fans and blowers covered under the definition of “fan” as established in this final determination are likely higher.

In response to the November 2016 NODA analysis, A.O. Smith Corporation ("A.O. Smith") commented that there were additional categories of equipment that incorporate fans. A.O Smith listed equipment such as boilers, water heaters, and pool heaters. (Docket No. EERE-2013-BT-STD-0006; A.O. Smith, No. 219 at p. 2) Greenheck listed other HVACR equipment that were not captured in DOE’s estimate. (Docket No. EERE-2013-BT-STD-0006; Greenheck, No. 221.1 at pp. 20-21) However, A. O. Smith and Greenheck did not provide quantitative information to estimate these shipments. (Docket No. EERE-2013-BT-STD-0006; A. O. Smith , No. 219 at p. 2; Greenheck, No. 221.1 at pp. 20-21) AHRI commented that they estimated the number of fans in HVACR equipment to be between five to 14 million units. (Docket No. EERE-2013-BT-STD-0006; AHRI, No. 222 at p. 15) Daikin commented in support of this estimate and added that DOE overestimated the number of fans in air-handling units, noting that air-handler shipments should be closer to 130,000 – 230,000. (Docket No. EERE-2013-BT-STD-0006; Daikin, No. 216 at p. 4) AHRI submitted additional shipments data to the

California Energy Commission (“CEC”) Fan rulemaking docket which included updated shipments estimates.<sup>27</sup>

DOE reviewed the data submitted by AHRI to the CEC and subsequently revised the shipment estimates prepared for the November 2016 NODA. Specifically, DOE revised (1) air handling unit shipments from 330,402 units to 65,000 units; (2) chiller shipments from 12,759 to 27,000 units and used 7 instead of 14 fans per unit to calculate corresponding fan units; and (3) the number of fans per unit used in commercial packaged air-conditioning and heating equipment by capacity range.<sup>28</sup> The updates reduced the total shipments for the fans analyzed in the November 2016 NODA from 1.18 million to 721,725 units.<sup>29</sup>

Based on the shipments data, DOE estimates the shipments of fans and blowers to be at least 721,725 units per year. Both the estimates from the June 2011 NOPD and the updated estimates demonstrate that fans and blowers are distributed in commerce to a significant extent for industrial and commercial use, satisfying the second statutory element to qualify as “industrial equipment”. (*See* 42 U.S.C. 6311(2)(A)(ii))

### 3. Prior Inclusion as a Covered Product

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<sup>27</sup> AHRI's submission to the CEC docket is available here: CEC Docket 17-AAER-06, TN#221201-1. Available at: [efiling.energy.ca.gov/GetDocument.aspx?tn=221201-1&DocumentContentId=26700](http://efiling.energy.ca.gov/GetDocument.aspx?tn=221201-1&DocumentContentId=26700).

<sup>28</sup> For return and exhaust fans, DOE assumed an average of 0.06 to 0.85 fans per unit depending on the capacity of the unit instead of 0.5 to 1.5 fans per unit. See Table 6 of CEC Docket 17-AAER-06, TN#221201-1. Available at: [efiling.energy.ca.gov/GetDocument.aspx?tn=221201-1&DocumentContentId=26700](http://efiling.energy.ca.gov/GetDocument.aspx?tn=221201-1&DocumentContentId=26700).

<sup>29</sup> The November 2016 NODA analyzed certain categories of fans with a fan shaft input power equal to or greater than 1 horsepower and fan air power equal or less than 150 horsepower as recommended in the term sheet. (Docket No. EERE-2013-BT-STD-0006; No. 179, Recommendation #1,2,3,5, at pp.1-4)

To qualify as “industrial equipment” fans and blowers must not be a “covered product” as that term is defined in 42 U.S.C. 6291(a)(2). (42 U.S.C. 6311(2)(A)(iii))

“Covered product” is defined through reference to the enumerated list of products at section 6292(a) of EPCA, which includes “any other type of consumer product which the Secretary classifies as a covered product” pursuant to certain statutory criteria. (42 U.S.C. 6291(a)(2)) The fans and blowers are not included in the enumerated list of covered products in section 6292(a) of EPCA and the Secretary has not previously determined such fans and blowers to be covered products, though DOE does regulate ceiling fans and furnace fans. Further, the definition of fans (*i.e.*, fans and blowers) established in this document explicitly excludes ceiling fans and furnace fans, both defined at 10 CFR 430.2. Therefore, equipment that is covered under the definition of “fans” (*i.e.* fans and blowers) established in this document are not covered products as that term is defined in 42 U.S.C. 6291(a)(2).

DOE concludes that the third element of “industrial equipment” is satisfied. (*See* 42 U.S.C. 6311(2)(A)(iii))

#### 4. Coverage Necessary to Carry Out the Purposes of Part A-1

The purpose of Part A-1 is to improve the energy efficiency of electric motors, pumps, and certain other industrial equipment to conserve the energy resources of the Nation. (42 U.S.C. 6312(a)) In the 2011 NOPD, DOE initially determined that coverage of fans and blowers was necessary to carry out the purposes of Part A-1 of EPCA because coverage would potentially promote the conservation of energy resources. DOE

estimated that technologies exist that could reduce the electricity consumption of fans by as much as 20 percent<sup>30</sup>. 76 FR 37678, 37680.

In response to the 2011 NOPD, the CA IOUs commented that commercial and industrial fans and blowers represent a significant potential for energy savings. To illustrate the potential energy savings, the CA IOUs presented estimates of how different blade designs compare in terms of energy efficiency, noting that some designs (*i.e.*, airfoil, backward curved/inclined centrifugal fans and vanaxial axial fans) are better than others. (CA IOUs, No. 6 at pp. 1-2)

In response to the June 2011 NOPD, AHRI commented that systems that includes commercial and industrial fans and blowers are already subject to DOE energy conservation standards. AHRI asserted that Part A-1's purpose has already been achieved through DOE's energy conservation standards for commercial equipment; the minimum energy efficiency requirements within these standards adequately account for the energy consumption of various components within a system, including fans and blowers. (AHRI, No. 3 at pp. 1-2) In response to the January 2013 Framework Document, AHRI added that setting energy conservation standards for fans and blowers used in HVAC applications would not ensure an optimized energy savings solution for this category of equipment and that ASHRAE Standard 90.1 already includes fan efficiency requirements for certain categories of HVAC fans. (Docket No. EERE-2013-BT-STD-0006; AHRI, No. 12 at p. 1) Also, in response to the January 2013 Framework Document, AMCA, EEI, Lennox, commented that DOE's analysis should account for the existing fan efficiency requirements in ASHRAE Standard 90.1. (Docket No. EERE-2013-BT-STD-0006; AMCA, No. 19 at pp. 5, 32; EEI, No. 13 at p. 2; Lennox, No. 18, at

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<sup>30</sup> Martin, N., Worrel, E., et al. Emerging Energy Efficient Industrial Technologies, LBNL-46990, 10/2000.

p.3;) Ingersoll Rand/Trane noted that HVAC equipment that incorporate fans are already subject to minimum efficiency requirements in ASHRAE Standard 90.1. For fans going into these HVAC equipment, Ingersoll Rand/Trane commented that any improvements in the fan energy efficiency would not results in any energy savings as the HVAC equipment would continue to be designed to meet the equipment level metrics required by ASHRAE 90.1. (Docket No. EERE-2013-BT-STD-0006; Ingersoll Rand/Trane, No. 24, at p. 2) In response to the June 2011 NOPD, CTI also commented that much of the energy savings for standalone fans is already captured in ASHRAE 90.1 and in the International Energy Conservation Code. (CTI, No. 13, at p.2)

In response to the May 2021 RFI, AHRI reiterated its concern that the data evaluated in DOE's previous NODA analyses used a fan database with fan performance characteristics that may not have appropriately represented embedded fans. (AHRI, No. 16.2, at p. 5) Greenheck recommended that DOE reevaluate the potential energy savings for fans based on the new fan energy requirements included in the 2019 version of ASHRAE 90.1, as well as savings obtained from ongoing utility incentive programs, related state energy standards/codes and industry performance certifications programs. (Greenheck, No. 18, at pp. 2,3)

In the November 2016 NODA, DOE provided estimates of national energy savings that may result from potential energy conservation standards.<sup>31</sup> DOE analyzed six efficiency levels (“ELs”) representing lower efficiency fans (“baseline level” – EL0) and higher efficiency fans (“max tech” - EL6). To develop these efficiency levels, DOE identified existing technology options that affect efficiency. DOE then conducted a screening analysis to review each technology option and decide whether it: (1) is

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<sup>31</sup> The national impact analysis tool and results supporting the November 2016 NODA are available online at <https://www.regulations.gov/document/EERE-2013-BT-STD-0006-0192>



technologically feasible; (2) is practicable to manufacture, install, and service; (3) would adversely affect product utility or product availability; or (4) would have adverse impacts on health and safety. The technology options remaining after the screening analysis consisted of a variety of impeller designs and guide vanes. DOE used these technology options to divide the fan groups into subgroups and conducted a market-based assessment of the prevalence of each subgroup at the different efficiency levels analyzed. DOE analyzed six efficiency levels in the November 2016 NODA, including one efficiency level representing the efficiency target as recommended by AMCA<sup>32</sup> as well as additional levels above and below. 81 FR 75742, 75748. DOE estimated that technologies exist that could reduce the electricity consumption of a baseline fan by as much as 30 percent,<sup>33</sup> resulting in national energy savings ranging from 0.79 – 6.96 quads site savings over the 30 year analysis period (2.2 to 19.1 quads Full Fuel Cycle) depending on the EL considered. (Docket No. EERE-2013-BT-STD-0006; National Impact Analysis Spreadsheet, No. 192)

Regarding ASHRAE Standard 90.1 and its effect on the current mix of fan and blower efficiencies on the market, DOE considered confidential sales data provided by AMCA in development of fan efficiency distributions for the November 2016 NODA. DOE collected additional technical and market information specific to embedded fans to represent both the embedded fan and standalone fan markets. DOE applied these efficiency distributions to account for the fact that more efficient fans are already on the market when estimating energy savings from potential energy conservation standards. 81 FR 75742, 75751-75752.<sup>34</sup> Further, since the publication of the November 2016 NODA,

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<sup>32</sup> See AMCA's DOE Fan efficiency Proposal presented at the 59<sup>th</sup> AMCA Annual Meeting, January 24, 2015.

<sup>33</sup> Based on the difference in fan efficiency targets at EL0 and EL6.

<sup>34</sup> The efficiency distributions reflect market shares of fan shipments by efficiency level in the absence of an energy conservation standard. In the November 2016 NODA, DOE assumed that some fans are already

the industry standard in ASHRAE Standard 90.1 applicable to fans was revised to include updated fan efficiency requirements corresponding to approximately the stringency level in EL 3 as analyzed in the November 2016 NODA.<sup>35</sup> Because ASHRAE Standard 90.1 is approximately as stringent as EL 3 in the 2016 NODA analysis, the figures and analysis from the 2016 NODA can be used to determine remaining potential energy savings, assuming a full implementation of the fan requirements in ASHRAE 90.1. Even assuming full implementation of ASHRAE Standard 90.1, DOE estimates that there would remain a potential for additional energy savings ranging from 0.55 – 5.5 quads site energy savings (1.5 to 15.1 quads FFC energy savings) over the 30 year analysis period.

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The national energy savings results presented in the November 2016 NODA and the subsequent estimates that assume full implementation of relevant industry standards demonstrate that coverage of fans and blowers and energy conservation standards that may result from such coverage would improve the efficiency of fans and blowers. Such standards would further the purpose of Part A-1, to conserve the energy resources of the Nation.

### *C. Final Determination*

Based on the foregoing discussion, DOE concludes that including fans and blowers, as defined in this final determination, as covered equipment is necessary to carry

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being purchased at efficiency levels above the baseline. See "LCC Input" tab of the national impact analysis tool (Row #39) Available at <https://www.regulations.gov/document/EERE-2013-BT-STD-0006-0192>

<sup>35</sup> ANSI/ASHRAE/IES Standard 90.1-2019 (I-P), Energy Standard for Buildings Except Low-Rise Residential Buildings. Section 6.5.3.1.3 "Fan efficiency".

<sup>36</sup> To estimate these savings, DOE subtracted the national energy savings estimates at EL3 from the national energy savings estimates as projected by in the November 2016 NODA. The national impact analysis tool and results supporting the November 2016 NODA are available online at <https://www.regulations.gov/document/EERE-2013-BT-STD-0006-0192>

out the purposes of Part A-1. Based on the information discussed in sections II.B.1, II.B.2, and II.B.3 of this final determination, DOE is classifying fans and blowers as covered equipment.

This final determination does not establish test procedures or energy conservation standards for fans and blowers. DOE will address test procedures and energy conservation standards through its normal rulemaking process.

### **III. Procedural Issues and Regulatory Review**

#### *A. Review Under Executive Order 12866*

This coverage determination has been determined to be not significant for purposes of Executive Order (“E.O”) 12866, “Regulatory Planning and Review,” 58 FR 51735 (Oct. 4, 1993). As a result, the Office of Management and Budget (“OMB”) did not review this final determination.

#### *B. Review Under the Regulatory Flexibility Act*

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires preparation of an initial regulatory flexibility analysis (“IRFA”) for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by E.O. 13272, “Proper Consideration of Small Entities in Agency Rulemaking,” 67 FR 53461 (Aug. 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the rulemaking process. 68 FR 7990. DOE has made its

procedures and policies available on the Office of the General Counsel's website (<https://energy.gov/gc/office-general-counsel>).

DOE reviewed this final rule under the provisions of the Regulatory Flexibility Act and the policies and procedures published on February 19, 2003. This final determination does not establish test procedures or standards for fans and blowers. On the basis of the foregoing, DOE certifies that this final determination has no significant economic impact on a substantial number of small entities. Accordingly, DOE has not prepared an IRFA for this final determination. DOE will transmit this certification and supporting statement of factual basis to the Chief Counsel for Advocacy of the Small Business Administration for review under 5 U.S.C. 605(b).

#### *C. Review Under the National Environmental Policy Act of 1969*

Pursuant to the National Environmental Policy Act (NEPA) of 1969, DOE has analyzed this proposed action in accordance with NEPA and DOE's NEPA implementing regulations (10 CFR part 1021). DOE has determined that this rule qualifies for categorical exclusion under 10 CFR part 1021, subpart D, appendix A6 because it is strictly procedural and meets the requirements for application of a CX. See 10 CFR Part 1021.410. Therefore, DOE has determined that promulgation of this rule is not a major Federal action significantly affecting the quality of the human environment within the meaning of NEPA, and does not require an Environmental Assessment or Environmental Impact Statement.

#### *D. Review Under Executive Order 13132*

E.O. 13132, “Federalism,” 64 FR 43255 (Aug. 10, 1999), imposes certain requirements on Federal agencies formulating and implementing policies or regulations that preempt State law or that have federalism implications. The Executive order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735.

EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the industrial equipment that is the subject of this final determination. (42 U.S.C. 6316(a)(10); 42 U.S.C. 6297) Regarding equipment for which DOE has made a coverage determination pursuant to 42 U.S.C. 6311(1)(L) the preemption provisions of 42 U.S.C. 6297 begin on the date on which a final rule establishing an energy conservation standard is issued by the Secretary, except that any State or local standard prescribed or enacted for the equipment before the date on which the final rule is issued shall not be preempted until the energy conservation standard established by the Secretary for the equipment takes effect. (42 U.S.C. 6316(a)(10)) This final determination does not establish energy conservation standards for fans and blowers. DOE has examined this final determination and concludes that it does not preempt State law or have substantial direct effects on the States, on the relationship between the Federal government and the States, or on the distribution of power and responsibilities among the various levels of government. No further action is required by E.O. 13132.

### *E. Review Under Executive Order 12988*

With respect to the review of existing regulations and the promulgation of new regulations, section 3(a) of E.O. 12988, “Civil Justice Reform,” imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity, (2) write regulations to minimize litigation, (3) provide a clear legal standard for affected conduct rather than a general standard, and (4) promote simplification and burden reduction. 61 FR 4729 (Feb. 7, 1996). Regarding the review required by section 3(a), section 3(b) of E.O. 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation: (1) clearly specifies the preemptive effect, if any, (2) clearly specifies any effect on existing Federal law or regulation, (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction, (4) specifies the retroactive effect, if any, (5) adequately defines key terms, and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in section 3(a) and section 3(b) to determine whether they are met or it is unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, this final determination meets the relevant standards of E.O. 12988.

### *F. Review Under the Unfunded Mandates Reform Act of 1995*

Title II of the Unfunded Mandates Reform Act of 1995 (“UMRA”) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Public Law 104-4, sec. 201 (codified at 2

U.S.C. 1531). For a regulatory action likely to result in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of \$100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)). The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed “significant intergovernmental mandate,” and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect them. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820. DOE’s policy statement is also available at [www.energy.gov/sites/prod/files/gcprod/documents/umra\\_97.pdf](http://www.energy.gov/sites/prod/files/gcprod/documents/umra_97.pdf).

This final determination does not contain a Federal intergovernmental mandate, nor is it expected to require expenditures of \$100 million or more in any one year by the private sector. As a result, the analytical requirements of UMRA do not apply.

*G. Review Under the Treasury and General Government Appropriations Act, 1999*

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105-277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This final determination would not have any impact on the autonomy or integrity of the family as an institution. Accordingly,

DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

#### *H. Review Under Executive Order 12630*

Pursuant to E.O. 12630, “Governmental Actions and Interference with Constitutionally Protected Property Rights,” 53 FR 8859 (Mar. 15, 1988), DOE has determined that this final determination would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

#### *I. Review Under the Treasury and General Government Appropriations Act, 2001*

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for Federal agencies to review most disseminations of information to the public under information quality guidelines established by each agency pursuant to general guidelines issued by OMB. OMB’s guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE’s guidelines were published at 67 FR 62446 (Oct. 7, 2002). Pursuant to OMB Memorandum M-19-15, Improving Implementation of the Information Quality Act (April 24, 2019), DOE published updated guidelines which are available at [www.energy.gov/sites/prod/files/2019/12/f70/DOE%20Final%20Updated%20IQA%20Guidelines%20Dec%202019.pdf](http://www.energy.gov/sites/prod/files/2019/12/f70/DOE%20Final%20Updated%20IQA%20Guidelines%20Dec%202019.pdf). DOE has reviewed this final determination under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

#### *J. Review Under Executive Order 13211*



E.O. 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OIRA at OMB, a Statement of Energy Effects for any significant energy action. A “significant energy action” is defined as any action by an agency that promulgates or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor Executive order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy, or (3) is designated by the Administrator of OIRA as a significant energy action. For any significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

This final determination is not establishing energy conservation standards for fans and blowers. It is not a significant energy action, nor has it been designated as such by the Administrator at OIRA. Accordingly, DOE has not prepared a Statement of Energy Effects.

#### *K. Information Quality*

On December 16, 2004, OMB, in consultation with the Office of Science and Technology Policy (“OSTP”), issued its Final Information Quality Bulletin for Peer Review (“the Bulletin”). 70 FR 2664 (Jan. 14, 2005). The Bulletin establishes that certain scientific information shall be peer reviewed by qualified specialists before it is disseminated by the Federal Government, including influential scientific information related to agency regulatory actions. The purpose of the bulletin is to enhance the quality

and credibility of the Government’s scientific information. Under the Bulletin, the energy conservation standards rulemaking analyses are “influential scientific information,” which the Bulletin defines as “scientific information the agency reasonably can determine will have, or does have, a clear and substantial impact on important public policies or private sector decisions.” *Id.* at 70 FR 2667.

In response to OMB’s Bulletin, DOE conducted formal peer reviews of the energy conservation standards development process and the analyses that are typically used and has prepared a report describing that peer review.<sup>37</sup> Generation of this report involved a rigorous, formal, and documented evaluation using objective criteria and qualified and independent reviewers to make a judgment as to the technical/scientific/business merit, the actual or anticipated results, and the productivity and management effectiveness of programs and/or projects. DOE has determined that the peer-reviewed analytical process continues to reflect current practice, and the Department followed that process for developing energy conservation standards in the case of the present action.

#### *L. Congressional Notification*

As required by 5 U.S.C. 801, DOE will report to Congress on the promulgation of this final determination prior to its effective date. The report will state that it has been determined that the rule is a “major rule” as defined by 5 U.S.C. 804(2).

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<sup>37</sup> “Energy Conservation Standards Rulemaking Peer Review Report.” 2007. Available at [www.energy.gov/eere/buildings/downloads/energy-conservation-standards-rulemaking-peer-review-report-0](http://www.energy.gov/eere/buildings/downloads/energy-conservation-standards-rulemaking-peer-review-report-0).

#### **IV. Approval of the Office of the Secretary**

The Secretary of Energy has approved publication of this final determination.

#### **List of Subjects in 10 CFR 431**

Administrative practice and procedure, Confidential business information, Energy conservation, Incorporation by reference, Intergovernmental relations, Reporting and recordkeeping requirements, Small businesses.

#### **Signing Authority**

This document of the Department of Energy was signed on August 13, 2021, by Kelly Speakes-Backman, Principal Deputy Assistant Secretary and Acting Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the *Federal Register*.

Signed in Washington, DC, on August 13, 2021.

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Treena V. Garrett  
Federal Register Liaison Officer,

For the reasons set forth in the preamble, DOE amends part 431 of chapter II, subchapter D, of title 10 of the Code of Federal Regulations, as set forth below:

**PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN  
COMMERCIAL AND INDUSTRIAL EQUIPMENT**

1. The authority citation for part 431 continues to read as follows:

**Authority:** 42 U.S.C. 6291-6317; 28 U.S.C. 2461 note.

2. Add subpart J to read as follows:

**Subpart J –Fans and Blowers**

Sec.

431.171 Purpose and scope.

431.172 Definition.

431.173-431.176 [Reserved].

**Subpart J –Fans and Blowers**

**§ 431.171 Purpose and scope.**

This subpart contains provisions regarding fans and blowers, pursuant to Part C of Title III of the Energy Policy and Conservation Act, as amended, 42 U.S.C. 6311-6317.

This subpart does not cover “ceiling fans” as that term is defined and addressed in part

430 this chapter, nor does it cover “furnace fans” as that term is defined and addressed in part 430 of this chapter.

**§ 431.172 Definition.**

*Fan or blower* means a rotary bladed machine used to convert electrical or mechanical power to air power, with an energy output limited to 25 kilojoule (kJ)/kilogram (kg) of air. It consists of an impeller, a shaft and bearings and/or driver to support the impeller, as well as a structure or housing. A fan or blower may include a transmission, driver, and/or motor controller.

**§§ 431.173-431.176 [Reserved].**

[FR Doc. 2021-17715 Filed: 8/18/2021 8:45 am; Publication Date: 8/19/2021]